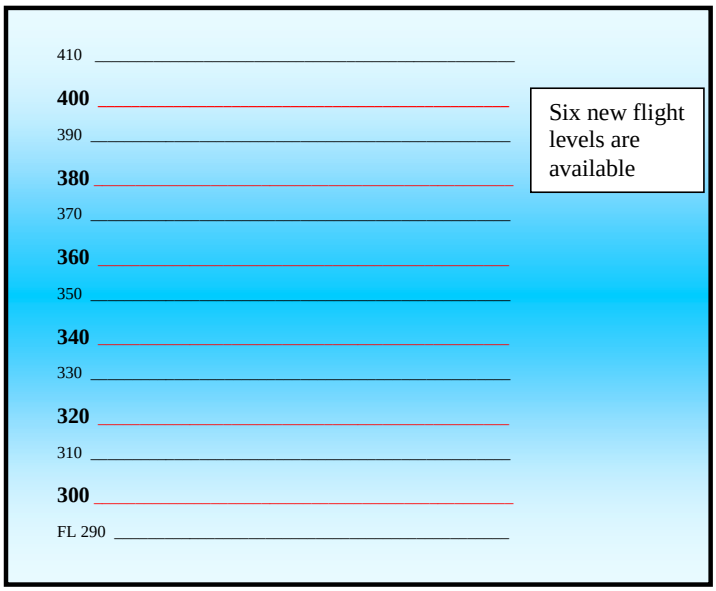
ER-4: Reduce Vertical Separation

Reduce vertical separation minima to 1,000 feet for flights operating between 29,000 feet and 41,000 feet.



Background

In US domestic airspace 1,000 foot vertical separation is applied up to FL 290 and 2,000 foot vertical separation is applied above FL 290. The Reduced Vertical Separation Minimum (RVSM) allows 1,000 foot vertical separation to be applied between FL 290 – 410 (inclusive). RVSM was implemented in the North Atlantic initially between FL 330-370 in March 1997 and expanded to FL 310-390 in October 1998. It was implemented in pacific oceanic airspace between FL 290-390 (inclusive) in February 2000.

Aircraft that are approved for RVSM are eligible to conduct RVSM operations worldwide. The operator, however, must also adopt ATS operational policies/procedures specific to individual areas of operation. Approximately 22% of aircraft that operate in the US above flight level 290 are RVSM approved as of March 2001 (2,400 of 11,100).

Ops Change Description

Implement RVSM in phases in the vertical stratum of US domestic airspace (e.g., initially implement between FL 350-390 (inclusive) with progression toward RVSM implementation in the full RVSM envelope (FL 290-410 (inclusive)). Phased implementation allows aircraft that are not RVSM approved at the start of Phase 1 to operate with limited operational penalty until phased out of service or modified to RVSM standards. Phased implementation provides flexibility for operators of aircraft that will be costly to modify. It also provides operators flexibility to plan RVSM modifications during scheduled maintenance inspections avoiding greater costs associated with special inspections. Non-equipped aircraft will be allowed to transition RVSM strata to operate normally at higher altitudes.

Benefits, Performance and Metrics

- Fuel Burn Savings. Fuel burn savings of approximately 1% per cent for US domestic operations. (***Preliminary*** analysis estimates that ***upper bound*** for fuel savings, when RVSM is implemented between FL 290-410, will be approximately $400 million per year).
- Increased Flight Level Availability. Makes six additional flight levels (for a total of 13) available for operations between FL 290-410. (Current FL orientation schemes applied between FL 290-410 provide seven useable FL's).
- Airspace Capacity. Increases airspace capacity. (Other factors, however, may limit the number of aircraft that can be managed).
- Controller Flexibility. Enhances controller flexibility. Provides more options for situations such as weather re-routes and crossing traffic.
- Controller Workload. Reduces controller work load.
- Enhanced Predictability. Enhances predictability of operations by increasing the flight levels available to move aircraft allowing more aircraft to fly at requested flight level.
- Delays. Decreases potential for delays caused by limitations in en route airspace capacity above FL 290.

Scope and Applicability

The Domestic Reduced Vertical Separation Minimum (DRVSM) Team has held meetings with user advocate groups and DoD. Such meetings will be scheduled periodically to inform and obtain feedback from users. Also, RVSM seminars will be held to educate users and FAA field offices on RVSM program requirements.

- July 16, 2001: proposed Phase 1 implementation date and - plan - to be finalized and coordinated with industry.
- December 2004: proposed Phase 1 implementation between FL 350-390 (inclusive).
- TBD: implement Phase 2.
- TBD: implement the full RVSM envelope (FL 290-410 (inclusive)).

Key Decisions

- Phased implementation dates and vertical stratum.
- Necessity to implement RVSM considering benefits and costs.
- Policy for accommodation of non-RVSM approved aircraft including military aircraft.
- Eligibility of small aircraft equipped with a single altimeter system.

Key Risks

- Cost/Benefit and Phase-In Plan. Acceptance of a cost effective phase-in plan to minimize the impact on aircraft that are expensive to modify (ATP, AFS).
- Accommodation of Un-Approved Aircraft. Acceptance of policies for accommodation of non-RVSM approved aircraft including DoD aircraft (ATP, AFS).
- Wake Turbulence/Mountain Wave. Development of procedures to mitigate the effect of wake turbulence and mountain wave effect (ATP, AFS).
- Flight Standards Field Resources. Development of plans for Flight Standards field office approval of large numbers of aircraft (approximately 8,700) and operators (approximately 900) (AFS).
- Aircraft Certification Office Resources. Development of plans for Aircraft Certification Office resources to approve individual unique (non-group) airframes for RVSM (AIR, AFS).
- Single Altimeter Equipage. Single altimeter system equipage for small aircraft (AFS, AIR).
- Coordination with Canada/Mexico. Coordination of implementation plan with Canada and Mexico (ATP, AFS, ACT).
- Safety Analysis. Acceptability of safety analysis to support the DRVSM implementation decision (ATP, AFS, ACT).
- Operator Fleet Readiness. Operator lead time to schedule/complete aircraft approval work is scheduling pacing factor. Operators must complete required actions in period leading up to implementation (AFS, AIR).
- TCAS Version 7.0. TCAS II, version 7.0 (or later version or equivalent) equipage requirement for aircraft equipped with TCAS II and used in RVSM operations.
- NAS System Modification Host and other system changes. (ATP).
- Pre and Post Implementation Monitoring. Pre- and post implementation monitoring program to assess key factors related to operational safety: data base of approved operators/aircraft; system to monitor aircraft altitude-keeping performance (AFS, ACT).
- Airspace Re-Design. DRVSM impact on High Altitude Airspace Re-design Program (ATP, ATA).